DEPARTMENT OF THE ARMY
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Washington, D.C. 20314-1000

ETL 1110-1-129

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15 December 1985

Engineer Technical
Letter 1110-1-129

Engineering and Construction
USE OF ENGINEERING FABRICS AND ASPHALT
RUBBER INTERLAYERS TO MINIMIZE REFLECTIVE CRACKING IN PAVEMENTS

1. Purpose. This letter provides guidance for minimizing reflective cracking of asphaltic concrete pavements.

2. Applicability. This letter applies to all HQUSACE/OCE elements and field operating activities (FOA) having military and/or civil works construction responsibility.

3. References. (See Enclosure 3).

4. Discussion.

a. Engineering fabrics and asphalt rubber have been used by various government agencies in an attempt to minimize the detrimental effects of reflective cracking. While performance has varied widely, it has been observed that these materials generally provide satisfactory performance in warm climates and unsatisfactory performance in cold climates. This letter provides recommended guidance concerning locations in which satisfactory performance can be expected with asphalt rubber and engineering fabrics based on results from recent studies at the Waterways Experiment Station (WES) including data from other sources, mainly Federal Highway Administration. Report of the WES studies is currently at the publishers and will be distributed in the near future. Some references from the report are provided with this ETL.

b. The studies involved evaluating the performance of a number of projects that had been constructed and observed over a period of years. After the results were obtained, it became apparent that performance was a function, of two important parameters-- overlay thickness and freezing index. The freezing index can be computed from temperature records for a given area using the guidance provided in TM 5-818-2, Pavement Design for Seasonal Frost Conditions.

5. Action to be Taken.

a. Figure 1 shows three climatic areas of the continental United States. Area I outlines an area with a freezing index below zero; Area II shows the area with a freezing index between zero and five hundred; and Area III shows the area having a freezing index greater than five hundred. If different local freezing indexes exist than shown on Figure 1, the existing should be used.

b. Based on evaluation of current materials the following guidance is provided for use of engineering fabrics or asphalt rubber.

(1) When overlaying asphaltic concrete, engineering fabric or asphalt rubber can be used in Areas I and II. A E-inch minimum overlay is required in Area I, and a minimum 3-inch overlay (at least two layers) is required in Area II. Neither asphalt rubber nor engineering fabric should be used when overlaying asphaltic concrete in Area III.

(2) When overlaying Portland-cement concrete (PCC), asphalt rubber is not effective as an interlayer and, therefore, should not be used. Engineering fabric is effective when used in Areas I and II, but should not be used in Area III. An engineering fabric strip is used to cover all joints when overlaying PCC to minimize the material costs. A 4-inch minimum overlay is required in Areas I and II to ensure satisfactory performance.

(3) Recommended properties of fabrics are shown in table 1.

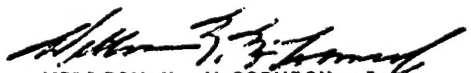
(4) When local experience has shown satisfactory performance different from that described in the above guidance, local criteria should be used.

(5) Performance of new materials used in Area III will be monitored and guidance will be provided on favorable materials as they develop.

(6) The guidance in this ETL will be incorporated in the appropriate road and airfield manuals.

6. Implementation. This letter will have routine application as defined in paragraph 6c, ER 1110-345-100. This letter will have application to all future civil works projects, except where local requirements govern otherwise.

FOR THE COMMANDER:



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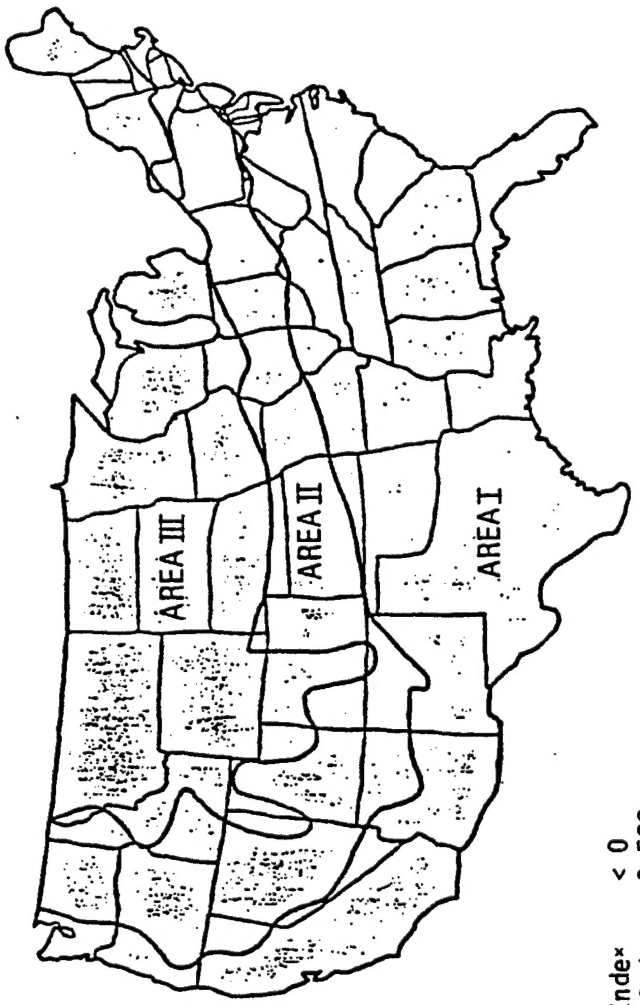

Area I Freezing Index < 0
Area II Freezing Index 0-500
Area III Freezing Index > 500

Figure 1. Three climatic areas of the continental United States

Enclosure 1

Table 1: Recommended Properties of Geotextiles Used to Reduce Reflective Cracking

Property	Requirement	Test Method
Tensile Strength, lbs.	80 minimum	ASTM D 1682
Elongation-at-Break, %	50 minimum	ASTM D 1682
Asphalt retention, gal/sq. yd.	0.2 minimum	TDHPT 3099
Melting point, Degrees F	325 minimum	ASTM D 276
Fabric weight, oz/sq. yd.	3.0 minimum 9.0 maximum	ASTM D 1910

Enclosure 2

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